(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 1 045 387 A1

(12) EUROPEAN PATENT APPLICATION

(43) Date of publication:
18.10.2000 Bulletin 2000/42

(51) Int. Cl.[7]: **G11B 20/00**, G06F 1/00

(21) Application number: **00108184.3**

(22) Date of filing: **13.04.2000**

(84) Designated Contracting States:
AT BE CH CY DE DK ES FI FR GB GR IE IT LI LU MC NL PT SE
Designated Extension States:
AL LT LV MK RO SI

(30) Priority: **14.04.1999 JP 10677299**

(71) Applicant:
Matsushita Electric Industrial Co., Ltd.
Kadoma-shi, Osaka-fu, 571-8501 (JP)

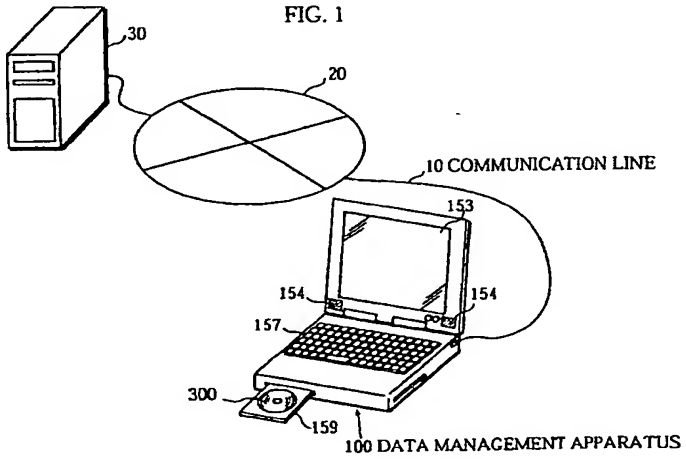
(72) Inventors:
- **Syoda, Yukie**
  Osaka-fu 570-0013 (JP)
- **Kozuka, Masayuki**
  California 91008 (US)
- **Hirata, Noboru,**
  Osaka-fu 576-0065 (JP)
- **Ohtani, Yukako**
  Osaka-fu 570-0034 (JP)

(74) Representative:
Grünecker, Kinkeldey,
Stockmair & Schwanhäusser
Anwaltssozietät
Maximilianstrasse 58
80538 München (DE)

(54) Data management apparatus, data management method, and record medium recording data management program

(57) The data type identification unit 103 obtains a circulation content from an external source or obtains a not encrypted content from a record medium. When the obtained content has the CD type, the data registration unit 104 encrypts the obtained content and writes the encrypted content to the data storage unit 106. The data registration unit 104 obtains the rights information from the rights management table 102, writes the data ID, encryption information, rights information, and file name to the data management table 105, and writes the encryption information and the rights information to the data storage unit 106. When the obtained content is a circulation content, the data registration unit 104 writes the circulation content to the data storage unit 106, and writes the data ID, encryption information, rights information, and file name to the data management table 105.

FIG. 1



EP 1 045 387 A1

Printed by Xerox (UK) Business Services
2.16.7 (HRS)/3.6

EPNSDOCID: <EP_____1045387A1_I_>

Description

BACKGROUND OF THE INVENTION

(1) Field of the Invention

[0001] The present invention relates to a system which deals with digital contents distributed in a market. More particularly, the present invention relates to a technique for protecting digital contents.

(2) Description of the Prior Art

[0002] Recently, various, a vast amount of information has been digitized, including art such as literature, music, and still or moving images. Typically, digital contents are distributed among users via record mediums such as CDs or CD-ROMs or via a network (hereinafter, digital contents distributed via a network are called circulation contents).

[0003] In the former case, users load distributed CDs into their personal computers and enjoy the digital contents of, for example, music recorded in the CDs.

[0004] In the latter case, circulation contents are downloaded into personal computers via a network, where communications capabilities of the computers are used. "Music Distribution Ready to Start" (Nikkei Electronics, No.738, pp87 to 111, Nikkei Business publications, Inc., issued on March 8th, 1999) introduces an music distribution system. The music distribution system features a content control method. According to this method, each circulation content includes a pair of files A and B. The file A is composed of an encrypted music content, and the file B is composed of a decryption key and control information, the decryption key being used for decrypting the file A, and the control information indicating whether playing or copying of the file A is permitted or not. When the playing of the music content included in the file A is attempted, the control information included in the file B is used to judge whether the file A can be played or copied.

[0005] The above-described music distribution system protects the contents from unauthorized operations of play, copy or the like by imposing a certain limit to such operations using the control information which indicates whether the operations on the contents corresponding to the control information are permitted or not.

[0006] However, in reality, some circulation contents do not include the control information. It is also typical that CDs include unencrypted music digital contents and do not include such control information. This brings a problem that digital contents are not sufficiently protected from unauthorized play or copy operations in personal computers.

SUMMARY OF THE INVENTION

[0007] It is therefore an object of the present invention to provide a data management apparatus, a data management method, and a record medium recording a data management program which protect circulation contents not including the control information and digital contents recorded in record mediums such as CDs or CD-ROMs, as well as circulation contents including the control information.

[0008] The above object is fulfilled by a data management apparatus for managing digital contents distributed in a market, with corresponding rights information, the data management apparatus comprising: a rights information storage means for prestoring a separate piece of rights information for each type of digital content, each piece of rights information including play rights information indicating whether reproduction is permitted for contents of the type corresponding to the piece of play rights information; a content storage means; a content obtaining means for obtaining from an external source a digital content to which rights information has not been added; a type identification means for identifying a type of the obtained digital content; a rights information reading means for reading rights information from the rights information storage means that corresponds to the type of the obtained digital content; a content writing means for writing the obtained digital content to the content storage means; and a rights information writing means for writing the read rights information to the content storage means so as to correspond to digital content written by the content writing means.

[0009] With the above construction in which when having obtained a content to which rights information has not been added, the data management apparatus stores the obtained content with corresponding rights information, it is possible to impose a limit to playing of the content in a similar way as "circulation contents" to which the rights information has been added. This enables the obtained content to be protected from unauthorized operations.

[0010] In the above data management apparatus, the content writing means may further add the read rights information to the digital content written to the content storage means.

[0011] With the above construction in which the data management apparatus adds the obtained rights information to the digital content written to the content storage means so that the content is stored with the same file type as "circulation contents", it is possible for apparatuses capable of managing circulation contents to which the rights information has been added beforehand to manage the content in the same way as the circulation contents.

[0012] In the above data management apparatus, each piece of rights information may further include copy rights information indicating whether a check out is permitted or not, wherein in each check out, a digital content and a piece of copy rights information corresponding to the digital content are copied to an external device.

BNSDOCID: <EP_____1045387A1_I_>

[0013] With the above construction in which the rights information includes the copy rights information as well as the play rights information, it is possible to impose a limit to check outs of the content as well as to playing of the content. This enables the obtained content to be protected from unauthorized operations.

[0014] In the above data management apparatus, each piece of copy rights information may include the number of permitted check outs.

[0015] With the above construction, the number of check outs performed on the content is limited to the number of permitted check outs.

[0016] In the above data management apparatus, each piece of rights information may further include move rights information indicating whether a digital content and a piece of rights information corresponding to the digital content are permitted to be moved to an external device.

[0017] With the above construction in which the rights information includes the move rights information as well as the play rights information, it is possible to impose a limit to moving of the content as well as to playing of the content. This enables the obtained content to be protected from unauthorized operations.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] These and other objects, advantages and features of the invention will become apparent from the following description thereof taken in conjunction with the accompanying drawings which illustrate a specific embodiment of the invention. In the drawings:

FIG. 1 shows a usage pattern of the data management apparatus 100 as an embodiment of the present invention;
FIG. 2 is a block diagram showing the construction of the data management apparatus 100;
FIG. 3 is a block diagram showing a detailed construction of the data management apparatus 100;
FIG. 4 shows an example of the control method table 101 in the data management apparatus 100;
FIG. 5 shows an example of the rights management table 102 in the data management apparatus 100;
FIG. 6 shows an example of the data management table 105 in the data management apparatus 100;
FIG. 7 is a flowchart showing the operation of the data management apparatus 100;
FIG. 8 shows a usage pattern of the data management apparatus 800 as another embodiment of the present invention;
FIG. 9 is a block diagram showing the construction of the data management apparatus 800;
FIG. 10 shows an example of the control method table 813 in the data management apparatus 800;
FIG. 11 shows an example of the multi data management table 807 in the data management apparatus 800;
FIG. 12 is a flowchart showing the operation of the data management apparatus 800 in obtaining a content from an external source or a record medium such as CD or DVD; and
FIG. 13 is a flowchart showing the operation of the data management apparatus 800 in writing a content to the record medium 811.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

1 Embodiment 1

[0019] A data management apparatus 100, an embodiment of the present invention, will be described.

[0020] As shown in FIG. 1, the data management apparatus 100 is connected to a network 20 via a communication line 10, where the network 20 is, for example, the Internet or a cable TV. A Web server 30 which supplies music information including music contents is also connected to the network 20. The data management apparatus 100 obtains music information from the Web server 30 and stores the obtained information. The data management apparatus 100 also reads out music information including music contents from a CD 300 and stores the obtained information. The data management apparatus 100 plays and outputs the stored music information from speakers 154.

[0021] In this way, users of the data management apparatus 100 can enjoy music.

1.1 Construction of Data Management Apparatus 100

[0022] The data management apparatus 100, as shown in FIG. 2, includes a control method table 101, a rights management table 102, a data type identification unit 103, a data registration unit 104, a data management table 105, and a data storage unit 106.

[0023] More specifically, as shown in FIG. 3, the data management apparatus 100 includes a microprocessor 151, a RAM (Random Access Memory) 152, a display 153, speakers 154, a hard disk 156, a keyboard 157, a communication unit 158, and a reading unit 159. The communication unit 158 is connected to the communication line 10. A computer program has been stored in the hard disk 156. The data type identification unit 103 and the data registration unit 104 operate as the computer program runs in the data management apparatus 100 using the microprocessor 151. The control method table 101, the rights management table 102, the data management table 105, and the data storage unit 106 are achieved in the hard disk 156.

Data Type Identification Unit 103

[0024] The data type identification unit 103 includes the communication unit 158 which is connected to the Web server 30 via the network 20 being, for example,

BNSDOCID: <EP_____1045387A1_I_>

the Internet or a cable TV. The data type identification unit 103 also includes the reading unit 159 which reads out data from record mediums such as CDs and DVDs.

[0025] The data type identification unit 103 obtains a circulation content from the Web server 30 based on an instruction from the user. Each circulation content includes a file A and a file B. The file A includes an encrypted content such as an encrypted music content. The file B includes rights information which indicates whether play, copy, or move of the file A is permitted or not. The file B also includes encryption method information indicating an encryption method used for encrypting the encrypted content, and includes a decryption key used for decrypting the encrypted content. The data type identification unit 103 outputs the obtained circulation content, the file name of the file A, and information indicating that the content to be sent is a circulation content to the data registration unit 104.

[0026] The data type identification unit 103, also based on an instruction from the user, reads out a not-encrypted content from a CD or DVD loaded into the data management apparatus 100 and outputs the read-out not-encrypted content and information indicating either CD or DVD to the data registration unit 104.

[0027] A type of the rights information which indicates whether play of the file A is permitted or not is referred to as play rights information.

[0028] Another type of the rights information which indicates whether copy of the file A is permitted or not is referred to as copy rights information. The copy rights information also indicates whether a check out is permitted or not and includes the number of permitted check outs. It should be noted here that in each "check out", a content and play rights information corresponding to the content are copied from the current apparatus to another apparatus and the number of permitted check outs for the content is reduced by one in the current apparatus. Also, in each "check in", the play rights information corresponding to the content is returned from the other apparatus to the current apparatus and the number of permitted check outs for the content is increased by one in the current apparatus. In this case, the content having been copied to the other apparatus becomes unusable.

[0029] A type of the rights information which indicates whether move of the file A is permitted or not is referred to as move rights information. Here, in each "move", a content and all types of rights information are copied from the current apparatus to another apparatus and the content is rendered unusable in the current apparatus for eternity.

Control Method Table 101

[0030] The control method table 101, as shown in FIG. 4, includes a plurality of sets of a data type, a data storage method, an encryption method, an encryption key generation method, a rights management method, and a rights presence information.

[0031] The "data type" shows a data type of a content. In FIG. 4, "circulation content" indicates that the content has been obtained via the network, and "CD" and "DVD" indicate that the contents have been obtained from mediums CD and DVD, respectively.

[0032] The "data storage method" includes a script which shows a procedure for processing the content.

[0033] In correspondence to "CD" shown in the "data type", the "data storage method" includes Script A which describes the data storage method as shown below. In correspondence to "DVD" shown in the "data type", the "data storage method" includes Script A' which is similar to Script A.

Script A

[0034]

(Step 1) Generate an encryption key using an encryption key generation method corresponding to the data type "CD" included in the same set.
(Step 2) Encrypt the content read out from a CD to generate an encrypted content using the generated encryption key and based on an encryption method corresponding to the data type "CD" included in the same set.
(Step 3) Write the generated encrypted content to the data storage unit 106 as a file A.
(Step 4) Refer to Script C included in the same set as the "rights management method", then in accordance with Script C, refer to the rights management table 102 and read out rights information corresponding to the data type "CD" in the same set.
(Step 5) Refer to Script C included in the same set as the "rights management method", then in accordance with Script C, write a data ID, encryption information, rights information, and a file name in the data management table 105. Furthermore, write the encryption information and the rights information to the data storage unit 106 as a file B. Here, the data ID includes an identifier which uniquely corresponds to a content included in the CD. The encryption information is composed of an encryption method and an encryption key. The encryption method is used in Step 2 of Script A. The encryption key is generated in Step 1 of Script A. Each file name is composed of a file identifier, a separator ".", and a file type ("dat" in the example shown in FIG. 6). The file identifier uniquely corresponds to a content stored in the CD. The rights information is read out from the rights management table 102.

[0035] In correspondence to data type "circulation content", the "data storage method" includes Script B described as follows.

BNSDOCID: <EP_____1045387A1_I_>

Script B

[0036]

(Step 1) Write the circulation contents obtained via the network to the data storage unit 106.
(Step 2) Write the data ID, encryption information, rights information, and file name to the data management table 105. Here, the data ID is the file identifier constituting the file name of the file A obtained via the network. The encryption information is composed of an encryption method and an encryption key. The encryption method is included in the file B obtained via the network. The encryption key is equal to the decryption key included in the file B obtained via the network. The rights information is obtained via the network. The "file name" is the file name of the file A obtained via the network.

[0037] The encryption method is a method for encrypting the content. In the present example, as shown in FIGs. 4 and 6, the encryption method in correspondence to the data types "CD" and "DVD" is "RSA". No encryption method is shown in correspondence to the data type "circulation content" in the same set.

[0038] The encryption key generation method is used in the encryption method shown in the same set. In the present example, as shown in FIG. 4, the encryption key generation method corresponding to the data types "CD" and "DVD" is "random number generations". Here, when the data type is "DVD", the length of the first tune recorded in the DVD disc is used as the seed in generating random numbers. No encryption key generation method is shown in correspondence to the data type "circulation content" in the same set.

[0039] In correspondence to "CD" shown in the "data type", the "rights management method" includes Script C which describes the rights management method as shown below. In correspondence to "DVD" shown in the "data type", the "rights management method" includes Script C' which is similar to Script C.

Script C

[0040]

(Step 1) Read out the rights information from the rights management table 102 and write the read rights information to the data management table 105.

[0041] It should be noted here that no rights management method is included in correspondence to the data type "circulation content" in the same set.

[0042] The rights presence information indicates whether rights information has been added to content. In the present example shown in FIG. 4, "0" indicates that the rights information has not been added to the content and "1" indicates that the rights information has been added to the content. As shown in FIG. 4, in the present embodiment, the rights information has not been added to the content read out from a CD or DVD, and the rights information has been added to the circulation content.

Rights Management Table 102

[0043] The rights management table 102, as shown in FIG. 5, includes a plurality of sets of a data type and rights information.

[0044] The "data type" shows a data type of a content and includes either "CD" or "DVD" indicating that the content has been read out from a CD or a DVD, but does not include "circulation content".

[0045] The rights information is composed of play rights information, copy rights information, and move rights information. The play rights information, copy rights information, and move rights information respectively show whether the user is permitted to play, copy, or move the content. "Available" indicates that the user is permitted to perform the operation. "Not available" indicates that the user is not permitted to perform the operation.

Data Management Table 105

[0046] The data management table 105, as shown in FIG. 6, includes a plurality of sets of a data ID, encryption information, rights information, and a file name.

[0047] Each set of the data corresponds to a content stored in the data storage unit 106 in a one-to-one relationship.

[0048] The data ID includes an identifier of the content.

[0049] The encryption information is composed of an encryption method and an encryption key. The encryption method is used for encrypting the content identified by the data ID of the same set. The encryption key is used for encrypting the content identified by the data ID of the same set.

[0050] The rights information is composed of play rights information, copy rights information, and move rights information. The play rights information, copy rights information, and move rights information respectively show whether the user is permitted to play, copy, or move the content. "Available" indicates that the user is permitted to perform the operation. "Not available" indicates that the user is not permitted to perform the operation.

[0051] The "file name" is a file name of a file stored in the data storage unit 106 and including a content identified by the data ID of the same set. Each file name is composed of a file identifier, a separator ".", and a file type ("dat" in the example shown in FIG. 6). The file

BNSDOCID: <EP_____1045387A1_I_>

identifier of the file name is equal to the identifier included in the data ID of the same set.

[0052] In an example shown in FIG. 6, the content corresponding to a set 281 has the CD data type; and the content corresponding to a set 282 has the circulation content data type.

Data Registration Unit 104

[0053] The data registration unit 104 receives from the data type identification unit 103 the circulation content, the file name of the file A, and information indicating that the sent content is a circulation content. The data registration unit 104 also receives not-encrypted contents and information indicating either CD or DVD for each of the not-encrypted contents.

[0054] When having received the information indicating that the sent content is a circulation content from the data type identification unit 103, the data registration unit 104 obtains a script describing a data storage method corresponding to data type "circulation content" from the control method table 101, and executes the obtained script.

[0055] When having received the information indicating that the sent content has been read from CD from the data type identification unit 103, the data registration unit 104 obtains a script describing a data storage method corresponding to data type "CD" from the control method table 101, and executes the obtained script. When having received the information indicating that the sent content has been read from DVD, the data registration unit 104 performs similarly.

Data Storage Unit 106

[0056] The data storage unit 106 stores contents in the same file type as the circulation contents which each include a file A and a file B.

1.2 Operation of Data Management Apparatus 100

[0057] The operation of the data management apparatus 100 will be explained with reference to the flowchart shown in FIG. 7.

[0058] When having obtained a circulation content from an external source, the data type identification unit 103 outputs the obtained circulation content, the file name of the file A, and information indicating that the content to be sent is a circulation content to the data registration unit 104. Alternatively, when having read out a not-encrypted content from a CD or DVD loaded into the data management apparatus 100, the data type identification unit 103 outputs the read-out not-encrypted content and information indicating either CD or DVD to the data registration unit 104 (step S101).

[0059] When having received the information indicating that the sent content is a circulation content from the data type identification unit 103 (steps S103 and S104), the data registration unit 104 obtains a script describing a data storage method corresponding to "circulation content" included in the same set from the control method table 101, and executes the obtained script to write the file A of the circulation content including an encrypted content to the data storage unit 106 (step S105), then writes the data ID, encryption information, rights information, and file name to the data management table 105 (step S106).

[0060] When having received the information indicating that the sent content has been read from CD from the data type identification unit 103 (step S103), the data registration unit 104 obtains a script describing a data storage method corresponding to "CD" in the same set from the control method table 101, and executes the obtained script to generate an encryption key using an encryption key generation method corresponding to "CD" (step S111), encrypts the content and generates an encrypted content using the generated encryption key and based on an encryption method corresponding to "CD" in the same set (step S112), writes the generated encrypted content to the data storage unit 106 (step S113), refers to Script C describing the rights management method, then in accordance with Script C, refers to the rights management table 102 and read out rights information corresponding to "CD" in the same set (step S114), refers to Script C describing the rights management method, then in accordance with Script C, writes the data ID, encryption information, rights information, and file name in the data management table 105, and writes the encryption information and the rights information to the data storage unit 106 (step S115).

1.3 Brief Account

[0061] As described above, in Embodiment 1, it is possible to protect not-encrypted contents of CDs or DVDs, as in circulation contents, by encrypting the contents with a certain encryption method and adding rights information to impose a certain limit to operations like play, copy, and move.

[0062] Also, even if a new data type is developed, it is possible to deal with the new data type without difficulty by adding the new data type, encryption method, encryption key generation method, rights management method, and rights information to the control method table 101 and the rights management table 102.

2 Embodiment 2

[0063] A data management apparatus 800, another embodiment of the present invention, will be described.

[0064] As shown in FIG. 8, the data management apparatus 800 is connected to a network 20, such as the Internet or a cable TV, via a communication line 10. A Web server 30 which supplies music information including music contents is also connected to the net-

BNSDOCID: <EP_____1045387A1_I_>

work 20. Furthermore, an accounting server 40 for distributing the rights information to users in accordance with usage charges confirmed to be payed by the users is connected to the network 20. The data management apparatus 800 obtains music information from the Web server 30 and stores the obtained information in itself. The data management apparatus 800, based on an instruction from the user, confirms that the user pays a usage charge for a desired content to the accounting server 40, and receives the rights information in accordance with the payed usage charge from the accounting server 40. The data management apparatus 800 also reads out music information including music contents from a CD 300 and stores the obtained information in itself. The data management apparatus 800, based on the received rights information, plays and outputs the stored music information from speakers 154.

[0065] The data management apparatus 800, based on the received rights information, also writes the stored music information to a record medium 811. The user can load the record medium 811 with the music information written on it into a portable player 401, which plays and outputs the music information from headphones 402. The record medium 811 is achieved by a semiconductor memory card, for example.

[0066] In this way, users of the data management apparatus 800 can enjoy music.

2.1 Construction of Data Management Apparatus 800

[0067] The data management apparatus 800, as shown in FIG. 9, includes a data type identification unit 801, a data type recording unit 802, a rights management table 803, an encrypting unit 804, a data storage unit 805, a multi data management table 807, an accounting processing unit 808, a data control unit 809, a type transformation unit 810, an input unit 812, and a control method table 813.

[0068] More specifically, as the data management apparatus 100, the data management apparatus 800 includes a microprocessor, a RAM, a display, speakers, a record medium drive, a hard disk, a keyboard, a communication unit, and a reading unit. The communication unit is connected to the communication line. A computer program has been stored in the hard disk. The data type identification unit 801, encrypting unit 804, accounting processing unit 808, data control unit 809, and type transformation unit 810 operate as the computer program runs in the apparatus using the microprocessor. The data type identification unit 801 and the accounting processing unit 808 includes the communication unit. The rights management table 803, data storage unit 805, multi data management table 807, and control method table 813 are achieved in the hard disk.

Input Unit 812

[0069] The input unit 812, which is achieved by the keyboard and the like, receives source information, content identifiers, and content operation information from the user, where the source information indicates sources of contents, the content identifiers are identifiers of contents, and the content operation information indicates contents operations which are classified into play, copy, and move.

[0070] Note that a source indicated by a piece of source information is one of an external source connected via the network and a record medium such as CD or DVD.

[0071] The input unit 812 outputs the received source information and the content identifiers to the data type identification unit 801. The input unit 812 also outputs the received source information, content identifiers, and content operation information to the data control unit 809.

Data type Identification Unit 801

[0072] The data type identification unit 801 receives the source information and the content identifiers from the input unit 812.

[0073] The data type identification unit 801 is, like the data type identification unit 103 of the data management apparatus 100, connected to external sources via the network such as the Internet or a cable TV.

[0074] The data type identification unit 801, when having received from the input unit 812 a content identifier and a piece of source information which indicates an external source connected via the network, obtains a circulation content identified by the received content identifier. Each circulation content includes a file A and a file B. The file A includes an encrypted content such as an encrypted music content. The file B includes rights information which indicates whether play, copy, or move of the file A is permitted or not. The file B also includes encryption method information indicating an encryption method used for encrypting the encrypted content, and includes a decryption key used for decrypting the encrypted content. The data type identification unit 801 outputs the obtained circulation content, the file name of the file A, and information indicating that the content to be sent is a circulation content to the data type recording unit 802.

[0075] The data type identification unit 801 includes a reading unit for reading data from record mediums such as CDs and DVDs.

[0076] The data type identification unit 801, when having received from the input unit 812 a content identifier and a piece of source information which indicates a record medium such as CD or DVD, reads out a not-encrypted content identified by the received content identifier from a CD or DVD loaded into the reading unit and outputs the read-out not-encrypted content and information indicating either CD or DVD to the data type recording unit 802.

BNSDOCID: <EP_____1045387A1_I_>

Rights Management Table 803

[0077] Description of the rights management table 803 is omitted here since it is the same as the rights management table 102 of the data management apparatus 100.

Control Method Table 813

[0078] The control method table 813, as shown in FIG. 10, includes a plurality of sets of a data type, an encryption method, and an encryption key generation method.

[0079] The data type corresponds to the source of the content. In FIG. 10, "CD" and "DVD" indicate that the contents have been read out from mediums CD and DVD, respectively.

[0080] The encryption method is a method for encrypting the content. In the present example, as shown in FIG. 10, the encryption method for "CD" and "DVD" is "RSA".

[0081] The encryption key generation method is used in the encryption method included in the same set. In the present example, as shown in FIG. 10, the encryption key generation method corresponding to "CD" and "DVD" is "random number generation". Here, when the data type is "DVD", the length of the first tune recorded in the DVD disc is used as the seed in generating random numbers.

Data type Recording Unit 802

[0082] The data type recording unit 802 receives from the data type identification unit 801 a circulation content, a file name of the file A, and information indicating that the sent content is a circulation content. The data type recording unit 802 also receives a not-encrypted content and information indicating either CD or DVD from the data type identification unit 801.

[0083] The data type recording unit 802, when having received a not-encrypted content and information indicating either CD or DVD from the data type identification unit 801, generates a random number, then use the generated random number to generate a sequence of six characters which are to be used as a content identifier.

[0084] The data type recording unit 802 then reads out, from the rights management table 803, rights information corresponding to the data type indicated by the received information.

[0085] The data type recording unit 802 also reads out, from the control method table 813, an encryption method and an encryption key generation method corresponding to the data type indicated by the received information, then generates an encryption key based on the read-out encryption key generation method.

[0086] The data type recording unit 802 writes the generated six-character sequence as a data ID to the multi data management table 807. The data type recording unit 802 also writes the read-out encryption method, encryption key, and rights information to the multi data management table 807. The data type recording unit 802 generates a file name by combining the generated six-character sequence, ".", and "dat" respectively as a file identifier, a separator, and a file type, then writes the generated file name to the multi data management table 807. The data type recording unit 802 also writes data type "CD" to the multi data management table 807. Note that the encryption information is composed of the encryption method and encryption key.

[0087] The data type recording unit 802 outputs the received not-encrypted content, the read-out encryption method, the generated encryption key, and the file name to the encrypting unit 804.

[0088] On receiving the circulation content, the file name of the file A, and information indicating that the sent content is a circulation content from the data type identification unit 801, the data type recording unit 802 writes the following to the data storage unit 805: the file identifier constituting the file name of the received file A, as a data ID; the encryption method included in the received circulation content; the decryption key included in the received circulation content; the rights information included in the received circulation content; the file name of the received file A; and data type "circulation content".

[0089] The data type recording unit 802 then writes the received circulation content to the data storage unit 805. In doing so, the file name of the file A of the circulation content is also written as the file name of the circulation content to the data storage unit 805.

Encrypting Unit 804

[0090] On receiving a not-encrypted content, an encryption method, an encryption key, and a file name from the data type recording unit 802, the encrypting unit 804 encrypts the received not-encrypted content using the received encryption key and based on the received encryption method to generate an encrypted content, then writes the generated encrypted content to the data storage unit 805. In doing so, the received file name is also written as the file name of the encrypted content to the data storage unit 805.

Data Storage Unit 805

[0091] The data storage unit 805 stores the encrypted contents generated by the encryption unit 804 and the circulation contents received by the data type recording unit 802.

Multi Data Management Table 807

[0092] The multi data management table 807, as

BNSDOCID: <EP_____1045387A1_I_>

shown in FIG. 11, includes a plurality of sets of a data ID, encryption information, rights information, a file name, and a data type.

[0093] Each set of data corresponds to a content stored in the data storage unit 805 in a one-to-one relationship.

[0094] The encryption information is composed of the encryption method and encryption key. The rights information is composed of play rights information, copy rights information, and move rights information.

[0095] The data ID, encryption method, encryption key, play rights information, copy rights information, move rights information, and file name will not be detailed here since these elements are the same as those included in the data management table of the data management apparatus 100.

[0096] The data type includes data types of the contents in correspondence to the sources of the contents. In the table, "circulation content" indicates that the content has been obtained via the network, and "CD" and DVD" indicate that the contents have been read out from mediums CD and DVD, respectively.

[0097] In an example shown in FIG. 11, the content corresponding to a set 901 has the CD data type; and the content corresponding to a set 902 has the circulation content data type.

Accounting Processing Unit 808

[0098] The accounting processing unit 808 is connected to external sources via a network such as the Internet or a cable TV.

[0099] The accounting processing unit 808 receives a content identifier and usage information indicating how the content is used from the data control unit 809.

[0100] The accounting processing unit 808, based on the received usage information, performs an accounting process in which the charge for the use of a content identified by the content identifier is payed to an external source, and receives the rights information in accordance with the payed usage charge from the external source. The rights information indicates whether play, copy, or move of the content is permitted or not.

[0101] The accounting processing unit 808 replaces the rights information written in the multi data management table 807 in a set including the received content identifier, with the rights information received from the external source.

Data Control Unit 809

[0102] The data control unit 809 receives the source information, content identifier, and usage information from the input unit 812.

[0103] The data control unit 809 compares the usage indicated by the received usage information with the rights information written in the same set as the received content identifier in the multi data management table 807 so as to judge whether the usage is available.

[0104] More specifically, the data control unit 809 judges that the usage is available when the corresponding rights information written in the play rights information, copy rights information, or move rights information is "available"; and judges that the usage is not available when it is "not available".

[0105] Having judged that the usage is available and a copy is available based on the copy rights information, the data control unit 809 instructs the type transformation unit 810 to transform the type of the content identified by the received content identifier to the type of the record medium loaded into the type transformation unit 810 and to write the content with the transformed type to the record medium. The data control unit 809 outputs the received content identifier to the type transformation unit 810.

[0106] Having judged that the usage is not available and when the received source information indicates "CD" or "DVD", the data control unit 809 ends the process.

[0107] Having judged that the usage is not available and when the received source information indicates an external source connected via the network, the data control unit 809 outputs the received content identification and the usage information of the content to the accounting processing unit 808. The data control unit 809 performs the judgement on whether the usage is available after the accounting process by the accounting processing unit 808 is complete. Then, when having judged that the usage is available based on the rights information, the data control unit 809 instructs the type transformation unit 810 to transform the type of the content identified by the received content identifier to the type of the record medium loaded into the type transformation unit 810 and to write the content with the transformed type to the record medium, and outputs the received content identifier to the type transformation unit 810.

Format Transformation Unit 810

[0108] The type transformation unit 810 includes a writing unit for writing data to the record medium 811.

[0109] Having received a content identifier and an instruction to transform the type from the data control unit 809, the type transformation unit 810 reads out a content identified by the received content identifier from the data storage unit 805, transforms the type of the read-out content to the type of the record medium 811 loaded into the type transformation unit 810, and writes the content with the transformed type to the record medium 811.

BNSDOCID: <EP_____1045387A1_I_>

Record Medium 811

[0110] The record medium 811, which is achieved by a semiconductor memory, DVD-RAM or the like, is loaded into the type transformation unit 810. The record medium 811 records contents whose type has been transformed by the type transformation unit 810.

2.2 Operation of Data Management Apparatus 800

[0111] The operation of the data management apparatus 800 will be explained with reference to the flowchart shown in FIG. 12.

[0112] The input unit 812 receives the source information, a content identifier, and the usage information input by the user. The data type identification unit 801 obtains a circulation content identified by the received content identifier from an external source or reads out a not-encrypted content identified by the received content identifier from a CD or a DVD (step S1001).

[0113] When having received the information indicating that the sent content has been read from CD from the data type identification unit 801 (step S1002), the data type recording unit 802 reads out rights information from the rights management table 803, reads out an encryption method and an encryption key generation method from the control method table 813, generates an encryption key, outputs the received not-encrypted content, the read-out encryption method, the generated encryption key, and the file name to the encrypting unit 804. The encrypting unit 804 encrypts the received not-encrypted content using the received encryption key and based on the received encryption method to generate an encrypted content, then writes the generated encrypted content to the data storage unit 805 (step S1006). The data type recording unit 802 writes the data ID, encryption information, rights information, file name, and data type to the multi data management table 807 (step S1007).

[0114] When having received the information indicating that the sent content is a circulation content from the data type identification unit 801 (steps S1002 and S1003), the data type recording unit 802 writes the data ID, encryption information, rights information, file name, and data type to the multi data management table 807 (step S1004), then writes the received circulation content to the data storage unit 805 using the file name of the received file A (step S1005).

[0115] Now, the operation of the data management apparatus 800 of writing a content to the record medium 811 will be described with reference to the flowchart shown in FIG. 13.

[0116] The data control unit 809 receives the source information and a content identifier, and the usage information from the input unit 812 (step S1101). The data control unit 809 then judges whether the usage indicated by the received usage information is available by comparing the usage indicated by the received usage information with the rights information written in the same set as the received content identifier in the multi data management table 807 (step S1102). When having judged that the usage is available and further having judged that a copy is available based on the copy rights information, the data control unit 809 instructs the type transformation unit 810 to transform the type of the content identified by the received content identifier to the type of the record medium loaded into the type transformation unit 810 and to write the content with the transformed type to the record medium, and outputs the received content identifier to the type transformation unit 810. Having received these, the type transformation unit 810 reads out a content identified by the received content identifier from the data storage unit 805, transforms the type of the read-out content to the type of the record medium 811 loaded into the type transformation unit 810, and writes the content with the transformed type to the record medium 811 (step S1103).

[0117] When having judged that the usage is not available (step S1102) and further having judged from the source information that the content has been read out from CD or DVD (step S1104), the data control unit 809 ends the process.

[0118] When having judged that the usage is not available (step S1102) and further having judged from the source information that the content has been received from an external source via the network (step S1104), the data control unit 809 outputs the received content identification and the usage information of the content to the accounting processing unit 808. The accounting processing unit 808, based on the received usage information, performs an accounting process in which the charge for the use of a content identified by the content identifier is payed to an external source, and receives the rights information in accordance with the payed usage charge from the external source, and then replaces the rights information, which is written in the multi data management table 807 in the same set as the received content identifier, with the rights information received from the external source (step S1105). The control moves to step S1102. In step S1102, the data control unit 809 performs the judgement on whether the usage is available again. Then, when having judged that a copy is available, the data control unit 809 writes the content to the record medium 811.

2.3 Portable Player 401

[0119] After the record medium 811 is loaded into the portable player 401, the portable player 401 reads out a content from the loaded record medium 811, plays the read-out content, and outputs the played content to the headphones 402.

BNSDOCID: <EP_____1045387A1_I_>

2.4 Brief Account

[0120] As described above, according to Embodiment 2, the data management apparatus 800 writes circulation contents, which have been obtained from external sources via the network and are composed of rights information and encryption information, to the data storage unit as they are. When having read out a content from a record medium such as CD, the data management apparatus 800 writes the content to the data storage unit only if it is an encrypted content, and writes a data type, rights information, and encryption information to the multi data management table. This construction relieves the data management apparatus 800 of the bother of transforming the file type of the content read out from a record medium such as CD to the file type of the circulation content by adding rights information and encryption information to it. This takes much of the load off the apparatus.

3 Other Variations

[0121]

(1) In the above embodiments, the data type "CD" may be replaced with "DVD-Video", "DVD-Music", or "circulation content including data of a plurality of different data types (e.g., music and images)".

In the above embodiments, the record medium 811 may be achieved by a semiconductor memory card. However, it may be achieved by an MD or the like.

(2) In the above embodiments, the data management apparatus obtains, via a network such as the Internet, a content which has been encrypted and includes rights information attached to it. However, the data management apparatus may obtain, via a network, a content which has not been encrypted and does not include rights information. In this case, the control method table 101 includes, in correspondence to this type of content, the same data storage method, encryption method, encryption key generation method, rights management method, and rights presence information as in correspondence to data type "CD" or "DVD". Also, when having received such a content, the data registration unit 104 generates an encryption key and encrypts the content in the same way as having received a content with data type "CD" or "DVD", outputs the encrypted content to the data storage unit 106, and writes the data ID, encryption information, rights information, and file name to the data management table 105.

(3) In the above embodiments, the following arrangement is possible. The type transformation unit 810 writes to the record medium 811 rights information which indicates that the play is available, the copy is not available, and the move is not available. When the record medium 811 in which a content and the above rights information is recorded is loaded into the portable player 401, the portable player 401 reads out the rights information from the record medium 811 and judges whether the play is available. When having judged that the play is available, the portable player 401 plays the content. When having judged that the play is not available, the portable player 401 does not play the content.

(4) In the above embodiments, the play rights, copy rights, and move rights information respectively show whether the user is permitted to play, copy, or move the content, where "available" indicates that the user is permitted to perform the operation, and "not available" indicates that the user is not permitted to perform the operation. However, the play rights, copy rights, and move rights information may include the number of permitted operations of play, copy, and move, respectively. In this case, the user is permitted to perform the operation as many times as the rights information indicates, and the number in the information is subtracted by one each time the user executes the operation.

Alternatively, the play rights, copy rights, and move rights information may each show a time limit for the operation. In this case, the user is permitted to perform the operation until the time limit has been reached.

(5) In the above embodiments, the data management apparatus 800 obtains music information via a network or from record mediums such as CD, and store, play, copy, or move the obtained music information. However, the data management apparatus 800 may deal with movie information including still image information, video information, sounds, and moving pictures, computer programs, character information, or multimedia information (e.g., HTML documents) which includes control information, character information, still images, moving images, and sounds.

(6) The present invention will be fulfilled by a method for achieving the above apparatuses. The present invention will also be fulfilled by a computer program which allows computers to execute the above method. The present invention will also be fulfilled by digital signals constituting the computer program.

The present invention will also be fulfilled by a computer-readable record medium (e.g., a floppy disk, a hard disk, a CD-ROM, an MO, a DVD, a DVD-ROM, a DVD-RAM, or a semiconductor memory) in which the computer program or the digital signals are recorded. Alternatively, the present invention will be fulfilled by the computer program or the digital signals recorded in the computer-readable record medium.

The present invention will also be fulfilled by

BNSDOCID: <EP_____1045387A1_I_>

the computer program or the digital signals having been transferred via a network such as a telecommunication, a wired or wireless communication line, and the Internet.

The computer program of the present invention may be transferred to another stand-alone computer system via a record medium recording the computer program or via a network, so that the computer program is executed by the computer system.

(7) The present invention may be fulfilled by combinations of the above embodiments and variations.

[0122] The present invention has been fully described by way of examples with reference to the accompanying drawings, it is to be noted that various changes and modifications will be apparent to those skilled in the art. Therefore, unless such changes and modifications depart from the scope of the present invention, they should be construed as being included therein.

Claims

1. A data management apparatus for managing digital contents distributed in a market, with corresponding rights information, the data management apparatus comprising:

   a rights information storage means for prestoring a separate piece of rights information for each type of digital content, each piece of rights information including play rights information indicating whether reproduction is permitted for contents of the type corresponding to the piece of play rights information;
   a content storage means;
   a content obtaining means for obtaining from an external source a digital content to which rights information has not been added;
   a type identification means for identifying a type of the obtained digital content;
   a rights information reading means for reading rights information from the rights information storage means that corresponds to the type of the obtained digital content;
   a content writing means for writing the obtained digital content to the content storage means; and
   a rights information writing means for writing the read rights information to the content storage means so as to correspond to digital content written by the content writing means.

2. The data management apparatus of Claim 1, wherein

   the content writing means further adds the read rights information to the digital content written to the content storage means.

3. The data management apparatus of Claim 1, wherein

   each piece of rights information further includes copy rights information indicating whether a check out is permitted or not, wherein in each check out, a digital content and a piece of copy rights information corresponding to the digital content are copied to an external device.

4. The data management apparatus of Claim 3, wherein

   each piece of copy rights information includes the number of permitted check outs.

5. The data management apparatus of Claim 1, wherein

   each piece of rights information further includes move rights information indicating whether a digital content and a piece of rights information corresponding to the digital content are permitted to be moved to an external device.

6. The data management apparatus of Claim 1 further comprising:

   a play means for obtaining a digital content and a piece of rights information corresponding to the digital content, and playing the obtained digital content in accordance with the read piece of rights information.

7. A data management method for use in a data management apparatus for managing digital contents distributed in a market, with corresponding rights information, the data management apparatus comprising a rights information storage means and a content storage means, the rights information storage means prestoring a separate piece of rights information for each type of digital content, each piece of rights information including play rights information indicating whether reproduction is permitted for contents of the type corresponding to the piece of play rights information, the data management method comprising:

   a content obtaining step for obtaining from an external source a digital content to which rights information has not been added;
   a type identification step for identifying a type of the obtained digital content;

BNSDOCID: <EP_____1045387A1_I_>

a rights information reading step for reading rights information from the rights information storage means that corresponds to the type of the obtained digital content;

a content writing step for writing the obtained digital content to the content storage means; and

a rights information writing step for writing the read rights information to the content storage means so as to correspond to digital content written by the content writing means.

8. The data management method of Claim 7, wherein

in the content writing step, the read rights information is added to the digital content written to the content storage means.

9. The data management method of Claim 7, wherein

each piece of rights information further includes copy rights information indicating whether a check out is permitted or not, wherein in each check out, a digital content and a piece of copy rights information corresponding to the digital content are copied to an external device.

10. The data management apparatus of Claim 9, wherein

each piece of copy rights information includes the number of permitted check outs.

11. The data management apparatus of Claim 7, wherein

each piece of rights information further includes move rights information indicating whether a digital content and a piece of rights information corresponding to the digital content are permitted to be moved to an external device.

12. The data management apparatus of Claim 7 further comprising:

a play step for obtaining a digital content and a piece of rights information corresponding to the digital content, and playing the obtained digital content in accordance with the read piece of rights information.

13. A computer-readable record medium storing a data management program for use in a data management apparatus which manages digital contents distributed in a market, with corresponding rights information, the data management apparatus comprising a rights information storage means and a content storage means, the rights information storage means prestoring a separate piece of rights information for each type of digital content, each piece of rights information including play rights information indicating whether reproduction is permitted for contents of the type corresponding to the piece of play rights information, the data management program comprising:

a content obtaining step for obtaining a digital content from an external source;

a type identification step for identifying a type of the obtained digital content;

a rights information reading step for reading rights information from the rights information storage means that corresponds to the type of the obtained digital content;

a content writing step for writing the obtained digital content to the content storage means; and

a rights information writing step for writing the read rights information to the content storage means so as to correspond to digital content written by the content writing means.

14. The data management method of Claim 13, wherein

in the content writing step, the read rights information is added to the digital content written to the content storage means.

15. The data management method of Claim 13, wherein

each piece of rights information further includes copy rights information indicating whether a check out is permitted or not, wherein in each check out, a digital content and a piece of copy rights information corresponding to the digital content are copied to an external device.

16. The data management apparatus of Claim 15, wherein

each piece of copy rights information includes the number of permitted check outs.

17. The data management apparatus of Claim 13, wherein

each piece of rights information further includes move rights information indicating whether a digital content and a piece of rights information corresponding to the digital content are permitted to be moved to an external

BNSDOCID: <EP_____1045387A1_I_>

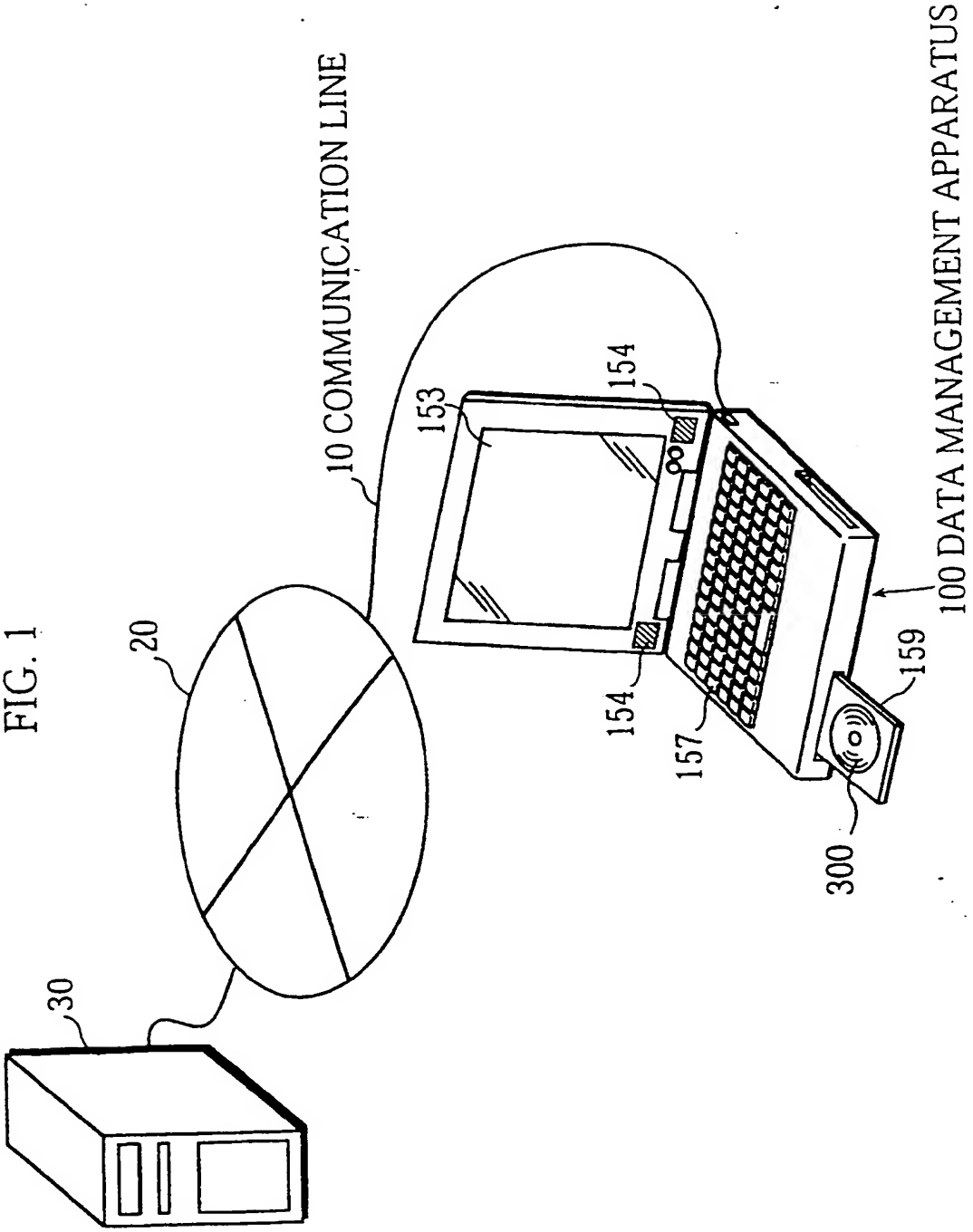
device.

18. The data management apparatus of Claim 13 further comprising:

a play step for obtaining a digital content and a piece of rights information corresponding to the digital content, and playing the obtained digital content in accordance with the read piece of rights information.

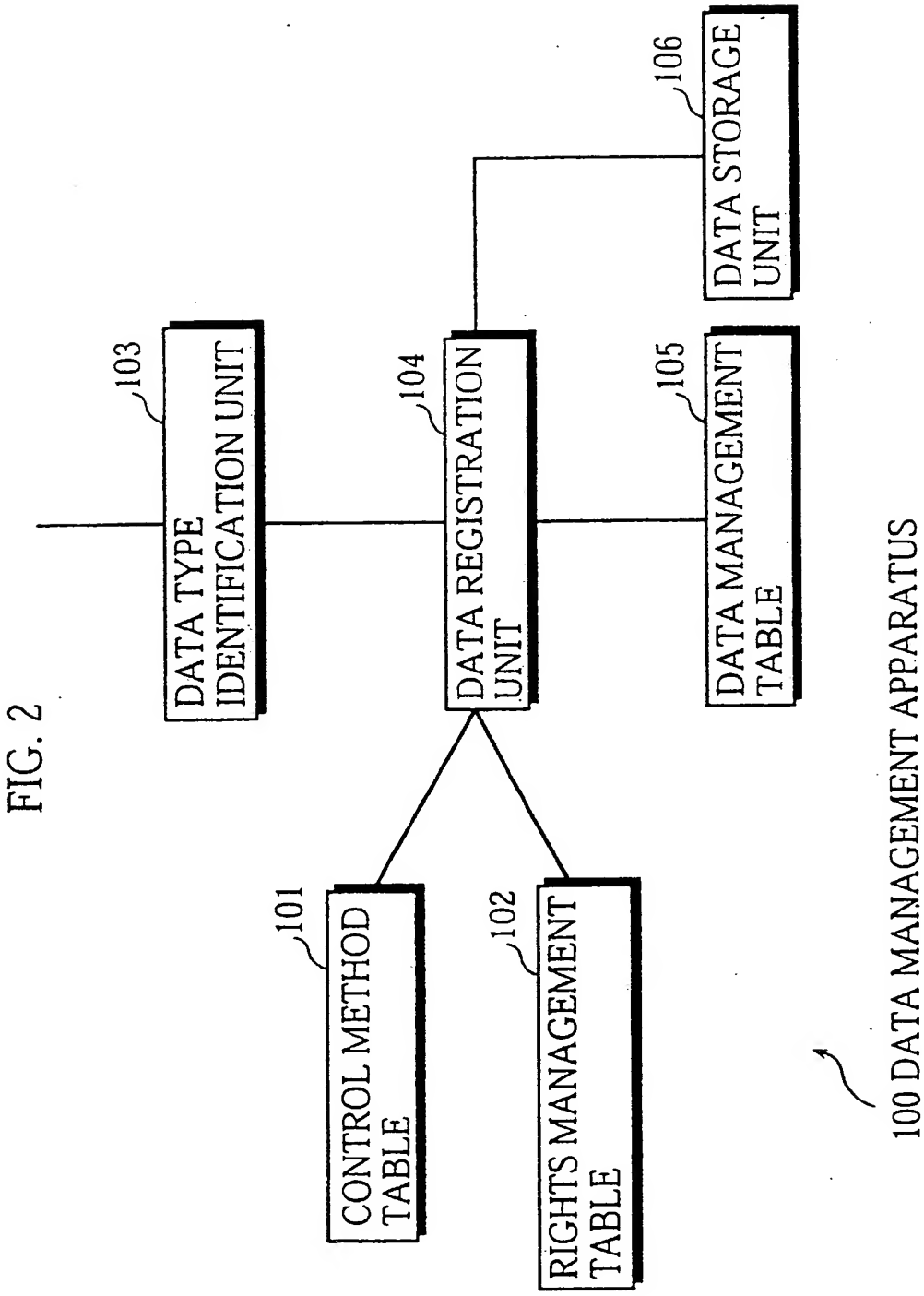
BNSDOCID: <EP_____1045387A1_I_>

FIG. 1



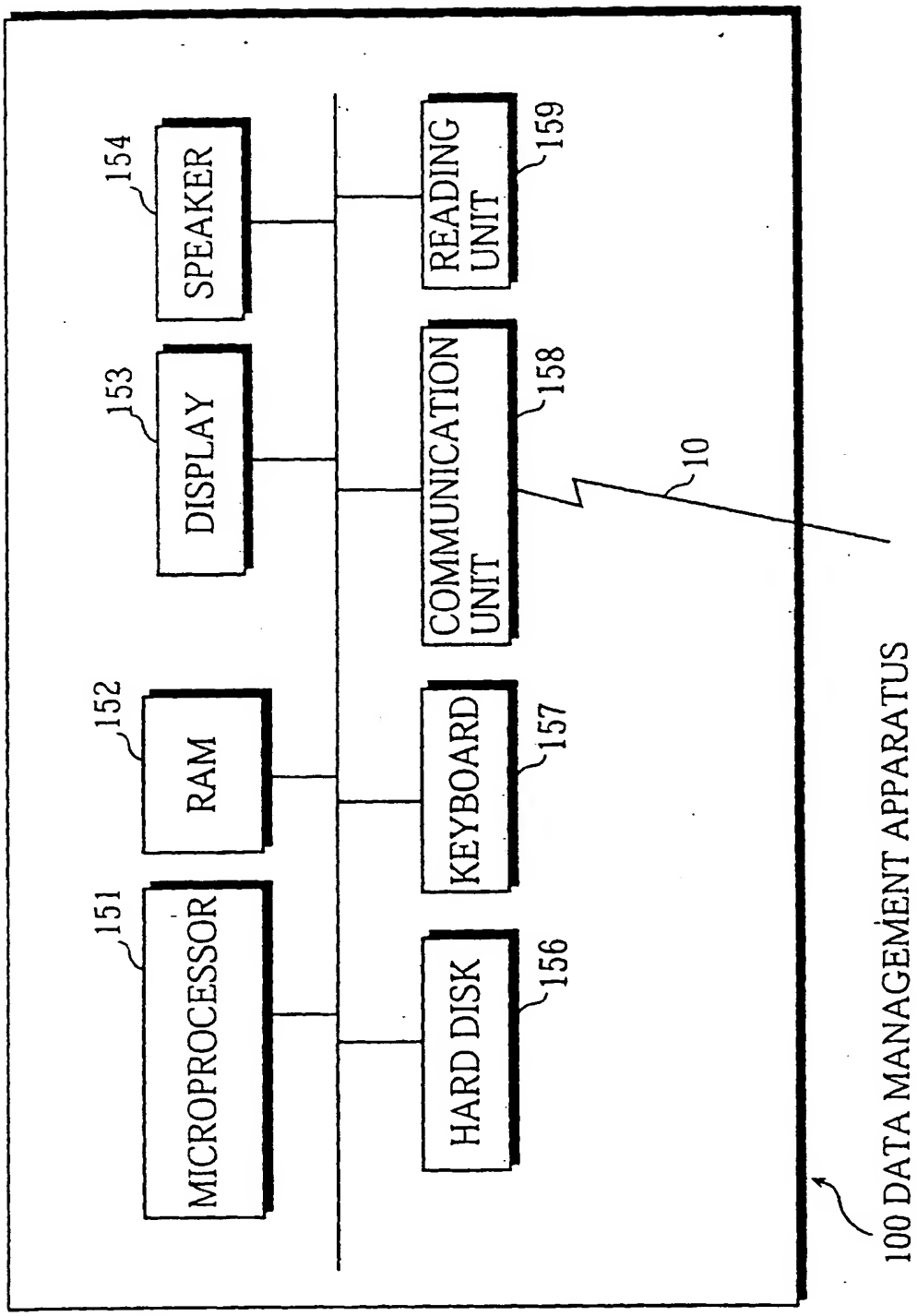
BNSDOCID: <EP_____1045387A1_I_>

FIG. 2



BNSDOCID: <EP_____1045387A1_I_>

FIG. 3



BNSDOCID: <EP_____1045387A1_I_>

EPNSDOCID: <EP_____1045387A1_I_>
18
EP 1 045 387 A1

FIG. 4

CONTROL METHOD TABLE 101

201 DATA TYPE	202 DATA STORAGE METHOD	203 ENCRYPTION METHOD	204 ENCRYPTION KEY GENERATION METHOD	205 RIGHTS MANAGEMENT METHOD	206 RIGHTS PRESENCE INFORMATION
CD	SCRIPT A	RSA	RANDOM NUMBER GENERATION	SCRIPT C	0
DVD	SCRIPT A'	RSA	RANDOM NUMBER GENERATION (SEED IS LENGTH OF FIRST TUNE IN DVD)	SCRIPT C'	0
CIRCULATION CONTENT	SCRIPT B	—	—	—	1

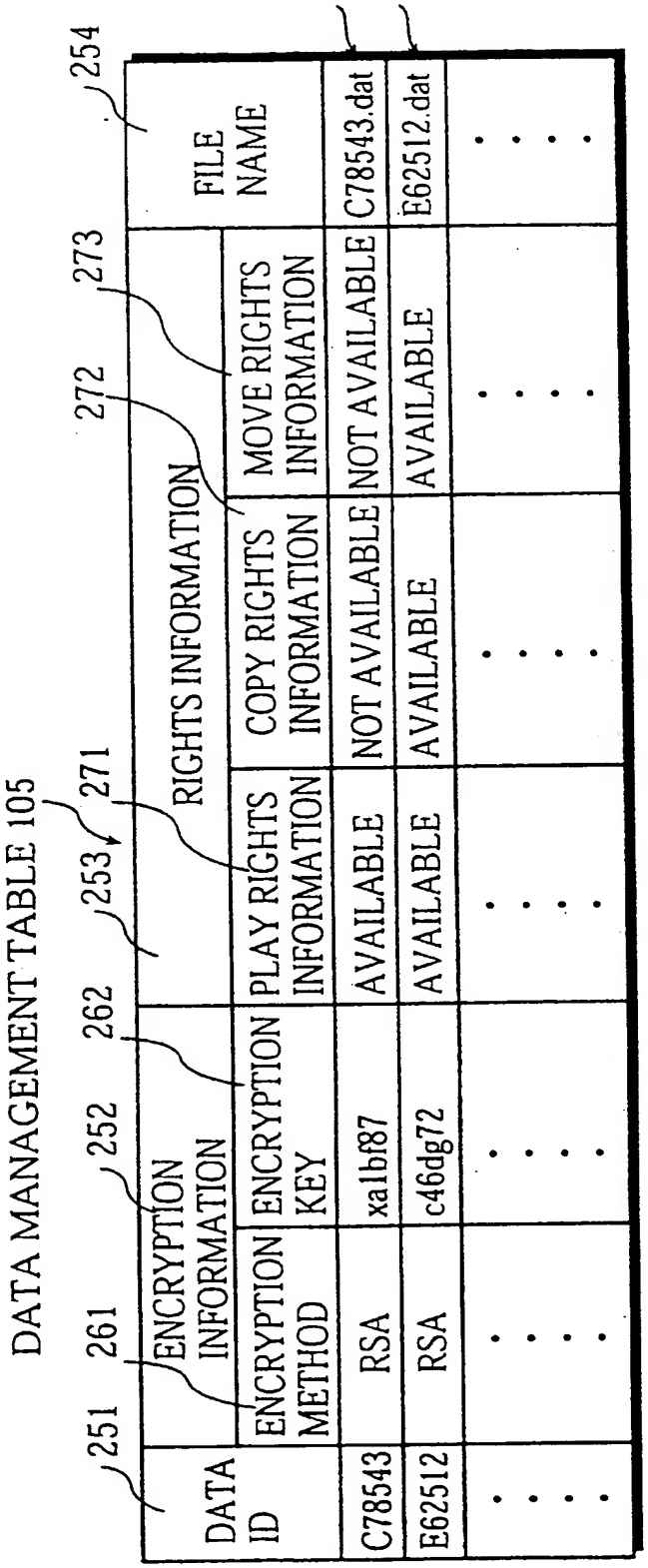
FIG. 5

RIGHTS MANAGEMENT TABLE 102

221	231	232	222	233
DATA TYPE	RIGHTS INFORMATION			
	PLAY RIGHTS INFORMATION	COPY RIGHTS INFORMATION	MOVE RIGHTS INFORMATION	
CD	AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	
DVD	AVAILABLE	NOT AVAILABLE	NOT AVAILABLE	

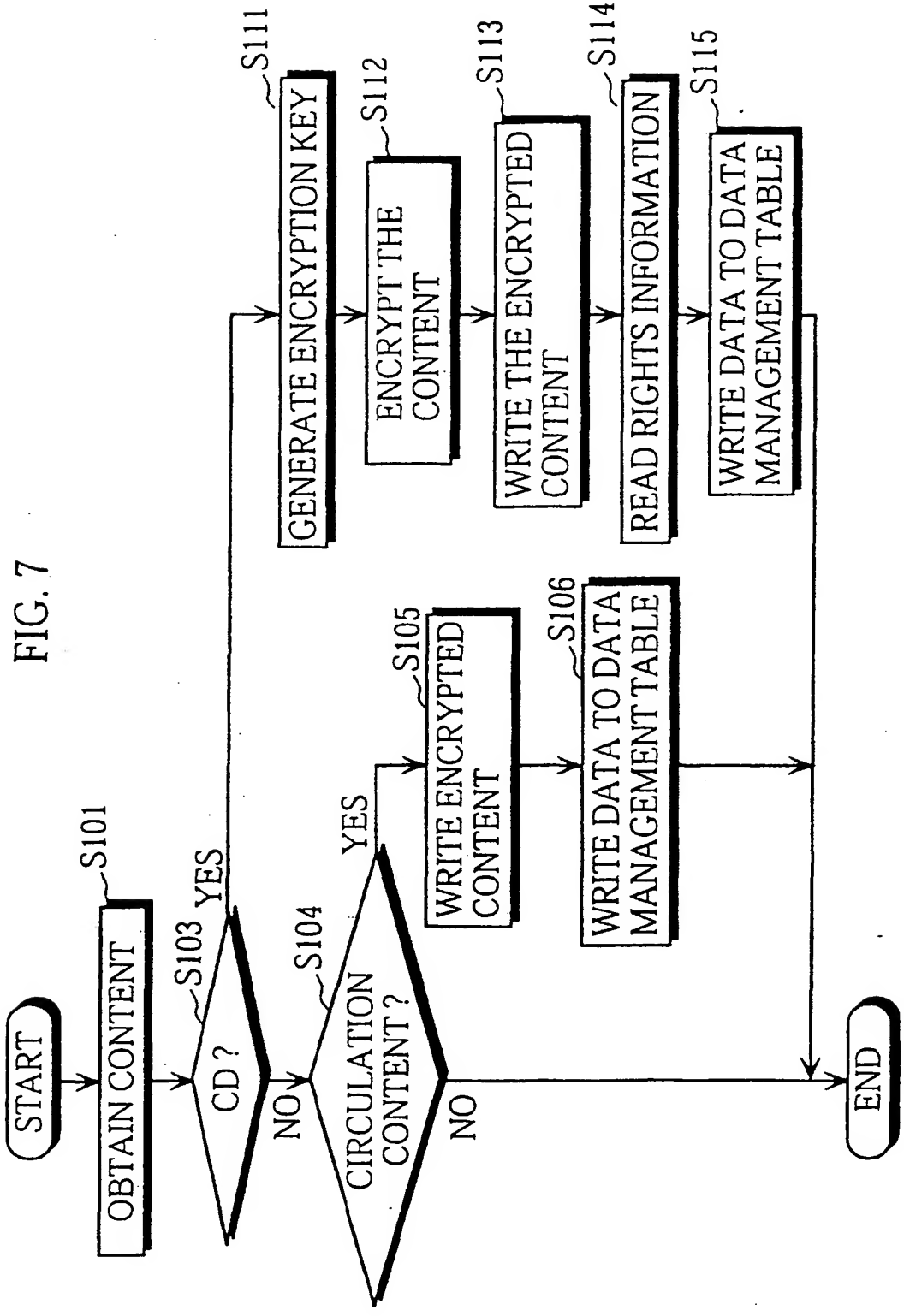
BNSDOCID: <EP_____1045387A1_I_>

FIG. 6



BNSDOCID: <EP_____1045387A1_I_>

FIG. 7



BNSDOCID: <EP_____1045387A1_I_>

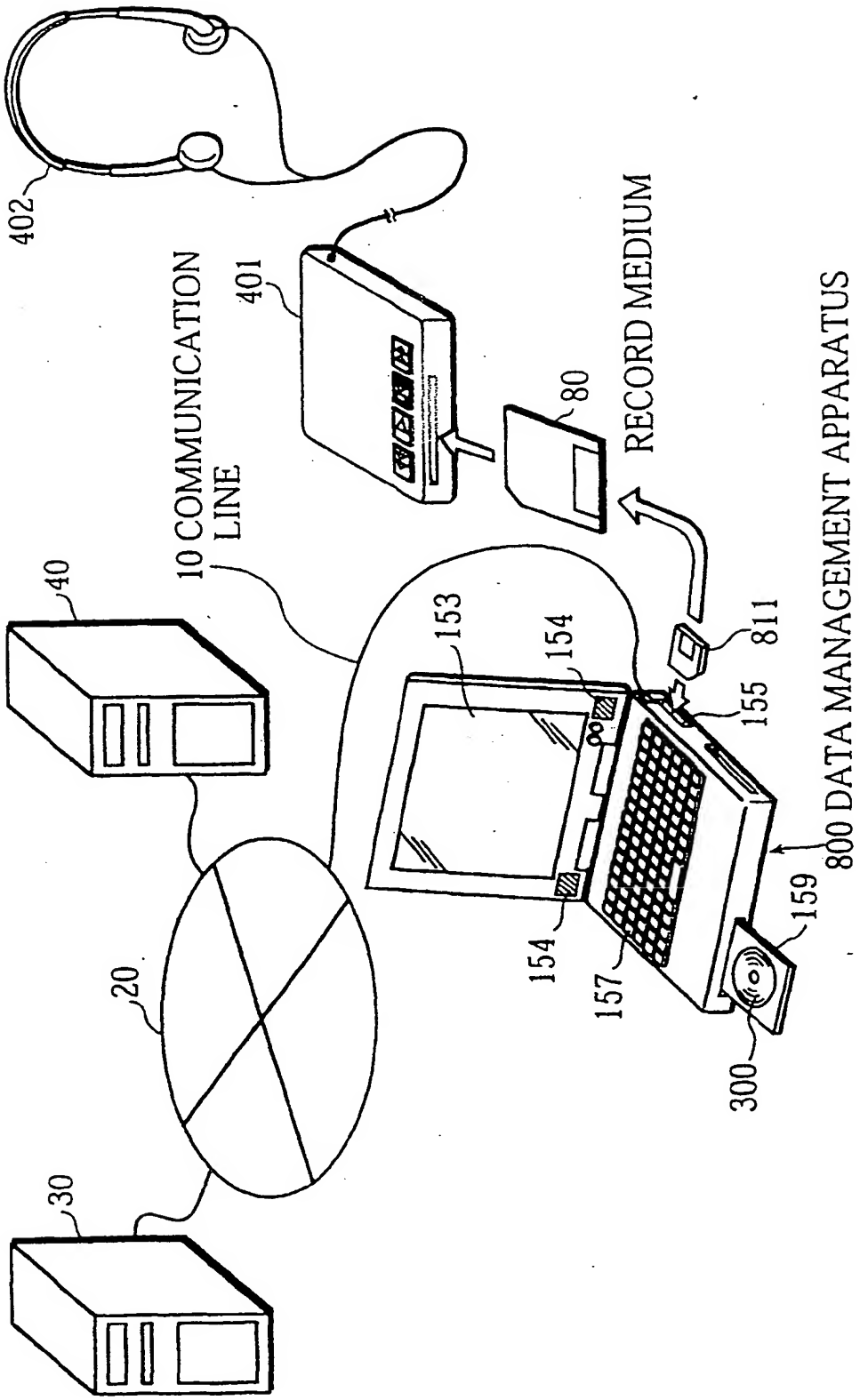
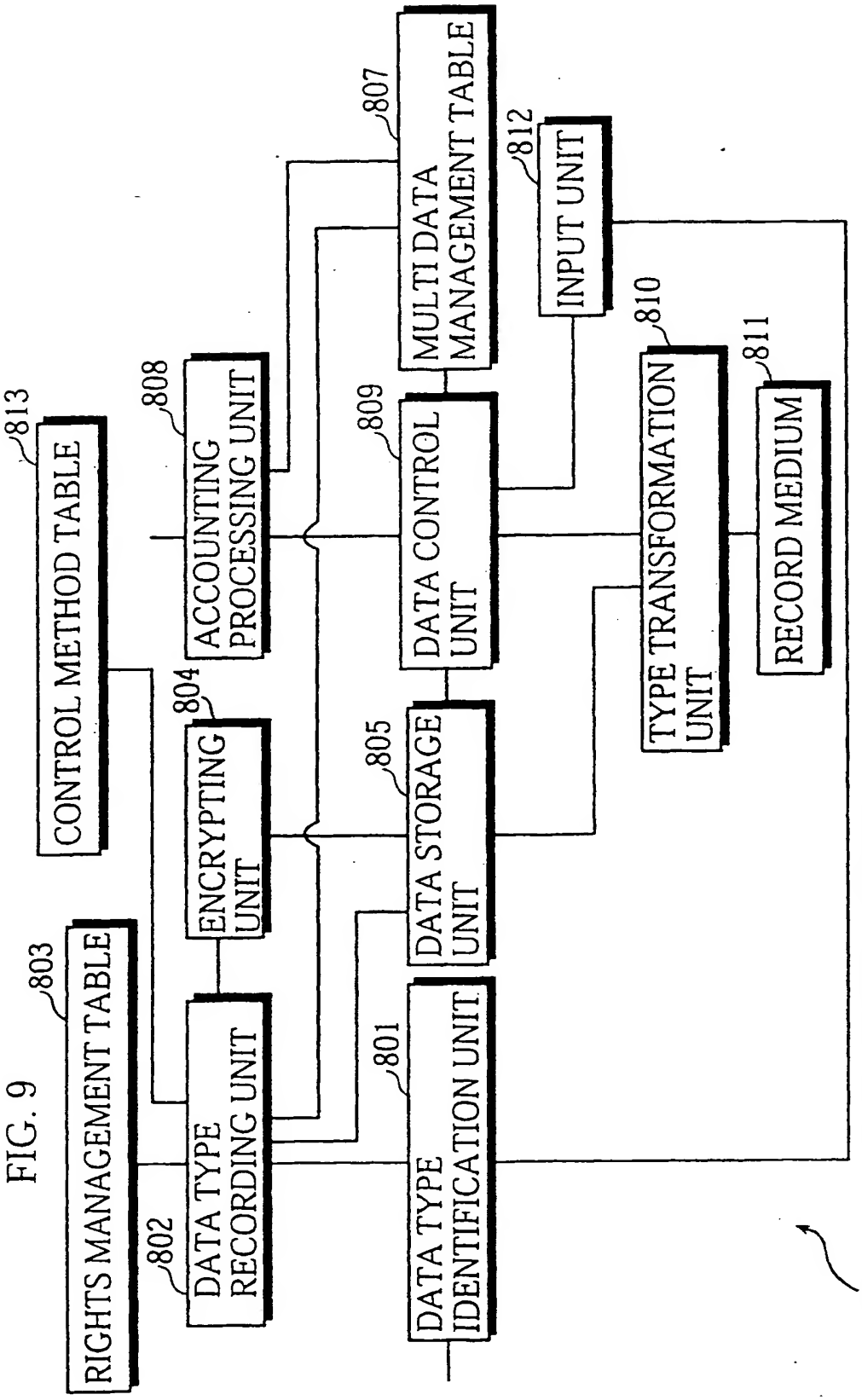


FIG. 8

BNSDOCID: <EP_____1045387A1_I_>

FIG. 9



BNSDOCID: <EP_____1045387A1_I_>

FIG. 10

CONTROL METHOD TABLE 813

951 DATA TYPE	952 ENCRYPTION METHOD	953 ENCRYPTION KEY GENERATION METHOD
CD	RSA	RANDOM NUMBER GENERATION
DVD	RSA	RANDOM NUMBER GENERATION(SEED IS LENGTH OF FIRST TUNE IN DVD)

BNSDOCID: <EP_____1045387A1_I_>

FIG. 11

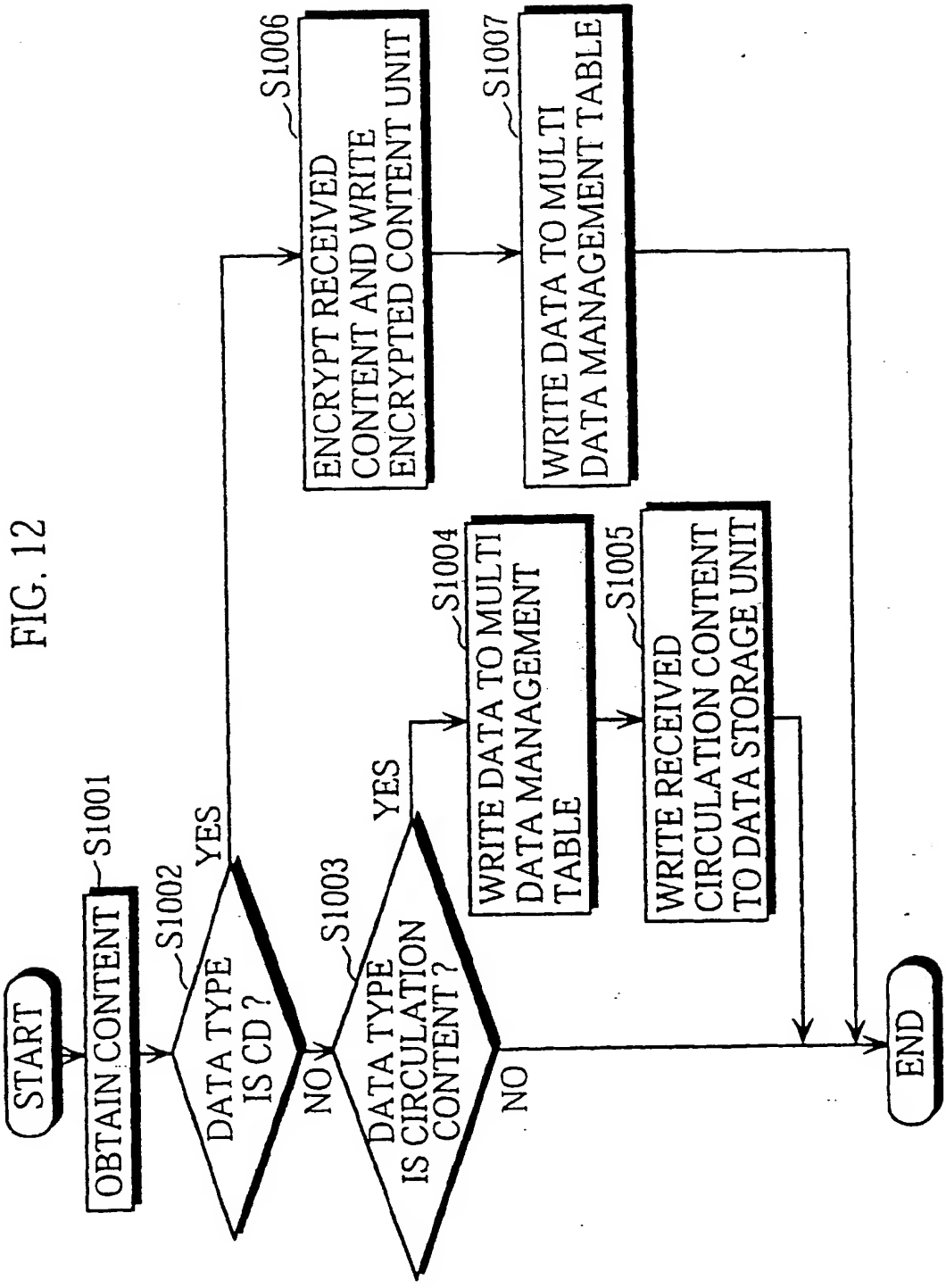
MULTI DATA MANAGEMENT TABLE 807

911 DATA ID	921 ENCRYPTION INFORMATION		912	922	913 RIGHTS INFORMATION	923	924	925	914 FILE NAME	915 DATA TYPE
	ENCRYPTION METHOD		ENCRYPTION KEY		PLAY RIGHTS INFORMATION	COPY RIGHTS INFORMATION	MOVE RIGHTS INFORMATION			
C78543	RSA		45fg17a		AVAILABLE	NOT AVAILABLE	NOT AVAILABLE		C78543.dat	CD
E62512	RSA		ce72hj2		AVAILABLE	AVAILABLE	AVAILABLE		E62512.dat	CIRCULATION CONTENT
. . .	.	.	.	.	.	.	.	.	.	.

901 902

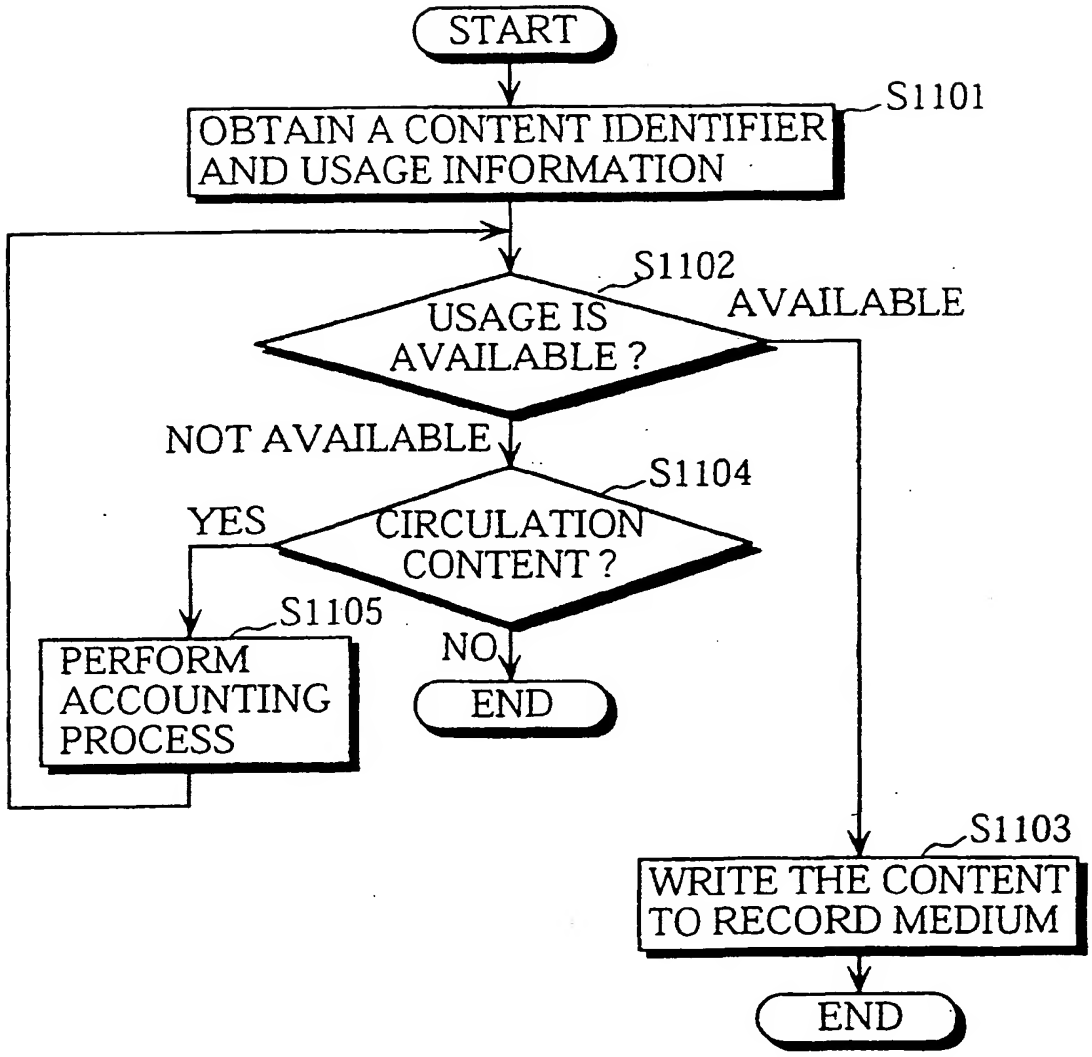
BNSDOCID: <EP_____1045387A1_I_>

FIG. 12



BNSDOCID: <EP_____1045387A1_I_>

FIG. 13



BNSDOCID: <EP_____1045387A1_I_>

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 00 10 8184

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 5 765 152 A (ERICKSON JOHN S) 9 June 1998 (1998-06-09) * figure 4 * * column 3, line 18 - column 4, line 15 * * column 6, line 5 - line 9 * * column 8, line 58 - column 9, line 24 * * column 10, line 40 - column 12, line 55 * * column 14, line 32 - line 54 * * column 15, line 8 - line 32 *	1-18	G11B20/00 G06F1/00
A	EP 0 773 490 A (FUJITSU LTD) 14 May 1997 (1997-05-14) * figure 9 *	1,2,6-8, 12-14,18	
A	EP 0 807 931 A (MATSUSHITA ELECTRIC IND CO LTD) 19 November 1997 (1997-11-19) * column 7, line 53 - column 12, line 11 *	1,7,13	
A	MARC A KAPLAN: "IBM Cryptolopes, SuperDistribution and Digital Rights Management" IBM RESEARCH, [Online] 30 December 1996 (1996-12-30), XP002132994 Retrieved from the Internet: <URL:http://www.research.ibm.com/people/k/kaplan/cryptolope-docs/crypap.html> [retrieved on 2000-03-14] * the whole document *	1,7,13	TECHNICAL FIELDS SEARCHED (Int.Cl.7) G11B G06F H04N G07F
E	WO 00 28539 A (MATSUSHITA ELECTRIC IND CO LTD) 18 May 2000 (2000-05-18) * the whole document *	1-18	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	9 August 2000	Ogor, M

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

BNSDOCID: <EP_____1045387A1_I_>

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 00 10 8184

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

09-08-2000

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5765152 A	09-06-1998	AU 7662496 A	30-04-1997
		WO 9714087 A	17-04-1997
EP 0773490 A	14-05-1997	JP 9134311 A	20-05-1997
		JP 9134330 A	20-05-1997
		US 5857021 A	05-01-1999
EP 0807931 A	19-11-1997	JP 9297798 A	18-11-1997
		CN 1170165 A	14-01-1998
		US 5987607 A	16-11-1999
WO 0028539 A	18-05-2000	EP 1001419 A	17-05-2000

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

BNSDOCID: <EP_____1045387A1_I_>

THIS PAGE BLANK (USPTO)